

## REMARKS

The Office Action sent on September 7, 2007 has been carefully reviewed and the response is made hereto. Applicants submit that entry of the instant amendment is warranted because the amendments put the instant application in condition for allowance. In addition, Applicants acknowledge the withdrawal of the Rejection under 35 U.S.C. 102 (e) and acknowledge with appreciation the allowability of claim 49.

### *Claim amendments*

Claims 1, 2, 4, 7, 9, 12-14, 18, 21-23, 30-32, 37, 39-41, 44, 48, 49 and 56-71 are amended. Claims 3, 5, 6, 8, 10, 11, 15-17, 19, 20, 24-29, 33-36, 38, 42, 43, 45-47 and 50-55 are cancelled without prejudice or disclaimer. Claims 1, 2, 4, 7, 9, 12-14, 18, 21-23, 30-32, 37, 39-41, 44, 48, 49 and 56-71 are currently pending.

Claim 1 is amended to recite that the xylanase is *Trichoderma reesei* xylanase II. Support for the amendment may be found throughout the specification, for example, at the paragraph bridging pages 15 and 16. In addition, claim 1 is amended to recite that the amino acid at position 116 is Gly. Support for this latter amendment may be found, for example, on page 21, first full paragraph. Accordingly, no new matter is added. Furthermore, language in claim 1 that became redundant in view of the amendments is deleted.

Claims 4, 7, 9, 12, 12, 14, 18, 21-23, 30-32, 37, 39-41, 44, 48 and 49 are amended to conform with claim 1 or to correct typographical matters.

### *Rejection under 35 U.S.C. §112, second paragraph*

Claim 1 is rejected as having insufficient antecedent basis for the term “modified Family 11 xylanase”.

Claim 1 now recites a modified *Trichoderma reesei* xylanase II, thereby rendering Examiner's rejection with respect to this claim moot. Accordingly, removal of the rejection is respectfully requested.

***Double patenting rejection***

Claims 1, 2, 4, 9 and 48 remain provisionally rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1, 2, 4-6 and 34-42 of U.S. Application No. 11/377,644.

Applicant submits concurrently herewith a terminal disclaimer disclaiming the term that extends beyond that of the patent that issues from the 11/377,644 application. Accordingly, removal of the rejection is requested.

***Rejection under 35 U.S.C. §112, first paragraph***

***(i) Enablement***

Claims 1-2, 4, 6, 7, 9, 11-14, 16, 18, 20-23, 25, 27, 29-32, 34, 37-41, 43, 44, 46, 48 and 56-71 stand rejected under 35 U.S.C.112, first paragraph, as lacking enablement on the ground that the specification does not reasonably provide enablement for any modified xylanase comprising at least one substitution selected from a non-polar amino acid at position 116, a Cys at position 118, a basic amino acid at position 144 and 161 wherein said positions correspond to the amino acid positions in SEQ ID NO:16. In particular, Examiner alleges that the specification does not enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make the invention commensurate in scope with these claims.

While not agreeing with Examiner's arguments as the claim clearly limits the xylanase to a family 11 xylanase, in order to expedite prosecution, claim 1 and claims that depend from claim 1, have been amended to recite that the modified xylanase is *Trichoderma reesei* xylanase II. Accordingly, removal of the rejection to claims 1-2, 4, 6, 7, 9, 11-14, 16, 18, 20-23, 25, 27,

29-32, 34, 37-41, 43, 44, 46, 48 and 56-71 under 35 U.S.C.112, first paragraph is respectfully requested.

Furthermore, Examiner alleges that the breadth encompassed as a result of the phrase “comprising” (open language) allows any number of additional changes, even if the claims were clearly limited to variants that are Family 11 xylanase. The Examiner further states that

the requirements for inclusion in the Family 11 xylanase enzymes are so broad (as low as 48% homology), that claims still encompass number [sic] of variants and would be an undue burden to one of skill in the art to make, identify variants with desired biological characteristics and use the variants for desired purposes.

It is submitted that *Trichoderma reesei* xylanase II mutants comprising amino acid substitutions at one or more of positions 116, 118, 144 and 161 have been extensively characterized by the inventor as evidenced by the numerous examples provided in the present specification. See for example, Table 2 on page 19 and Figures 3-8 and Figures 9 and 10 which show the temperature and pH activity profiles of various *Trichoderma reesei* xylanase II mutants. At least for this reason, Applicant submits that the claims are sufficiently enabled.

With respect to Examiner’s statement that “the breadth encompassed [by the claims] as a result of the phrase “comprising” (open language) allows any number of additional changes”, Applicant submits that there are only a limited number of mutations that could be introduced into the amino acid sequence to produce an enzyme that would still be considered a *Trichoderma reesei* xylanase II enzyme, and that would exhibit xylansase activity on a xylan substrate as defined in the claim. Thus, respectfully submitted, the transitional phrase “comprising” would not allow “any number of additional changes to the amino acid sequence”, as alleged by Examiner, since this language must be read in context with the other features present in the claim.

Additionally, conserved regions of Family 11 xylanases are well-documented in the prior art (see White Declaration submitted together with previous response), and the specification particularly points out such regions in *Trichoderma reesei* xylanase II disclosed in Figure 1.

(See bolded amino acids in Figure 1 for the entry corresponding to “Tr2”). It would be well-known by those of skill in the art that mutations at conserved positions are typically avoided in order to produce a variant with activity on a xylan substrate, and the specification provides adequate guidance as to how to identify such conserved positions.

Finally, Examiner alleges that the specification has not provided structure-function correlation and tolerance of any modified xylanase to maintain the required configuration of the molecule and specific biological characteristics, especially for at least one or more of any non-polar amino acids comprise bulky amino acids like phenylalanine, tyrosine, tryptophan and helix breaking amino acids like proline.

In response, Applicant has amended claim 1 to recite that the non-polar amino acid at position 116 is Gly.

Removal of the rejection to claims 1-2, 4, 6, 7, 9, 11-14, 16, 18, 20-23, 25, 27, 29-32, 34, 37-41, 43, 44, 46, 48 and 56-71 under 35 U.S.C.112, first paragraph is respectfully requested.

***(ii) Written Description***

Claims 1, 2, 4, 7, 9, 12-14, 18, 21-23, 25, 27, 30-32, 34, 37, 39-41, 44, 46, 48 and 56-71 are rejected under 35 U.S.C. §112, first paragraph, as failing to comply with the written description requirement. Examiner states on page 6, last two lines, that “[t]his rejection may be overcome by amending the claim to make clear that the mutant enzyme is a Family 11 xylanase.”

As noted above, Applicant has amended the claims so they are now directed to a *Trichoderma reesei* xylanase II. Applicant would like to draw to the Examiner’s attention that *Trichoderma reesei* xylanase II is a Family 11 xylanase enzyme. (See Table 1). Accordingly, removal of the rejection to claims 1-2, 4, 6, 7, 9, 11-14, 16, 18, 20-23, 25, 27, 29-32, 34, 37-41, 43, 44, 46, 48 and 56-71 under 35 U.S.C.112, first paragraph is respectfully requested.

It is respectfully submitted that the above-identified application is now in a condition for allowance and favorable reconsideration and prompt allowance of these claims is respectfully

requested. Should the Examiner believe that anything further is desirable in order to place the application in better condition for allowance, the Examiner is invited to contact the Applicant's undersigned attorney at the telephone number listed below.

### **CONCLUSION**

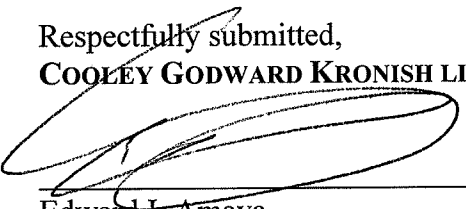
In view of the foregoing, Applicant respectfully submits that no further impediments exist to the allowance of this application and, therefore, requests an indication of allowability. However, the Examiner is requested to call the undersigned if any questions or comments arise.

Except for issue fees payable under 37 C.F.R. § 1.18, the Commissioner is hereby authorized by this paper to charge any additional fees during the entire pendency of this application including fees due under 37 C.F.R. §§ 1.16 and 1.17 which may be required, including any required extension of time fees, or credit any overpayment to Deposit Account No. 50-1283. This paragraph is intended to be a **CONSTRUCTIVE PETITION FOR EXTENSION OF TIME** in accordance with 37 C.F.R. § 1.136(a)(3).

Dated: January 7, 2008

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Respectfully submitted,  
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